

Creating a brighter future

G.Fast

**A Paper by the
Deployment & Operations Committee**

Contributors:

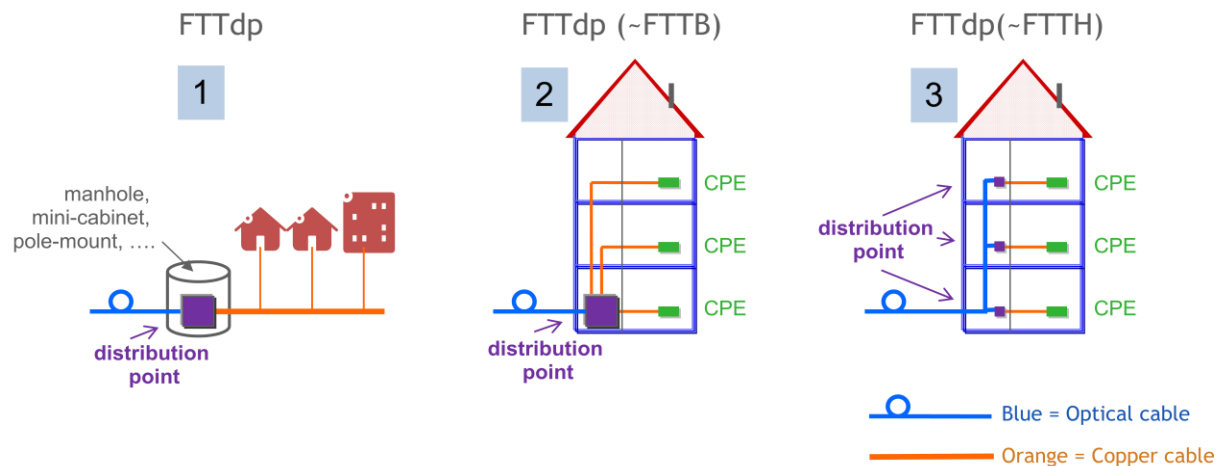
Eric Festraets, Alcatel-Lucent

Rong Zhao, Detecon

Copper-extending technologies: what is G.Fast and how can it help FTTH/B?

The concept of “Fibre-To-The distribution point”

Nowadays, one of the main hurdles for Fibre-To-The-Home is the “fiberisation” of the last meters towards the subscriber. If bringing fibre all the way is too cumbersome (for economical and/or practical reasons), there are ways to overcome this challenge. One can deploy wireless technologies (f.i. small cells) but why not make use of existing copper infrastructure, where available. The evolution of so-called “copper-extending technologies” encompasses today VDSL2 (with or without vectoring) and tomorrow G.Fast (with or without vectoring). G.Fast stands for the latest transmission technology over twisted pair, capable of delivering more than 1 Gbps over limited distance of approximately 100 meters. In that light, a new architectural definition appears in the market: “Fibre-To-The-distribution point” or FTThp, distribution point being the location of the transition between fibre and copper (see drawing).



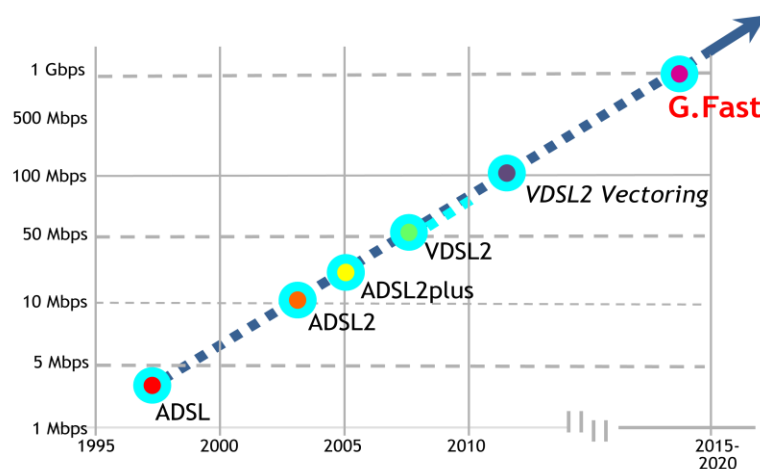
As depicted above, this distribution point can be found at 3 distinct locations :

1. In a manhole, pole or mini-cabinet at approximately 100 to 200 meters from the customer
2. At the entrance (inside or outside) of the building
3. At the stage of the building very close to the apartment door

The FTTH Council promotes both FTTH and FTTB today, so it is obvious that case 2 and 3 fall under the current definitions of the Council and are supported as FTTB solutions. While some operators consider case 1 as an extra step towards FTTH/B on the longer run, the FTTH Council Europe sees case 2 and 3 as preferred choices.

G.Fast : offering “fibre-like” speeds over copper

As depicted beneath, G.Fast is the next high speed transmission technology over copper twisted pair, delivering up to 1 Gbps to the subscriber, available for public trials today but standard to be finalised early 2014 (draft version has been consented December 2013). As a consequence, availability of (standardised) commercial products can only be expected from late 2015/early 2016 onwards. For reaching up to 1 Gbps, G.Fast is making use of higher frequencies (106/212 Mhz), limiting the distance of transmission to maximum 250 meters, due to strong attenuation (less than 100 meter recommended to go beyond 500Mbps). Today, for FTTdp architectures, one can deploy VDSL2, and later, once available, implement G.Fast.



For Fibre-To-The-Cabinet/VDSL2 deployments nowadays, one can introduce vectoring technology to significantly reduce crosstalk between copper pairs in the binder and restore the bandwidth availability to as if the subscriber was the only one in the binder, in other words without any crosstalk at all. Moving fibre even closer to the customer (FTTdp), G.Fast can be deployed on distinct pairs in the same binders, also here vectoring can be introduced to significantly reduce the crosstalk and increase the available bandwidth to the subscriber.

Summarising, deploying fibre closer to the premises and reusing copper (G.Fast) allows to overcome the “last drop challenges” (including associated costs):

- Processing and timing for rights of way, especially in shared private properties
- Convincing customers that new fibre “wires” will be deployed in their homes
- Convincing customers to switch to a new infrastructure (and a new offer)

Powering of the equipments can be easily done in “reverse” mode (endorsing power from the end-customer) or in “remote mode” (endorsing power from the network over existing copper wires).



FTTH Council Europe
Rue des Colonies 11
1000 Brussels
Belgium
Tel +32 2 517 6103
Fax +32 2855 71142
info@ftthcouncil.eu
www.ftthcouncil.eu



www.ftthcouncil.eu